Book Preview

Toppling Relativity: My Struggle with the Church of Physics

By Ashish Sirohi

(This book is to be published in fall 2018. Chapter 1 explains why an observer cannot catch up to light, which Einstein had no direct explanation for. This preview is of current draft; the actual book will be as published. The physics won't change, but how to explain it could. Feedback welcome – fill form at below website or send email.)

This draft is dated: 12 June 2018

If you are a physicist and want to read the related technical paper, you can get it from

http://churchofphysics.org/SR Discrete 2018.pdf

Contact Ashish Sirohi, as@churchofphysics.org

Preview of the early Chapters

Preview of Chapter 1. Back to 1905: Solving the Mystery of the Motion of Light & Explaining Why Observers Cannot Catch up to Light

We visit Albert Einstein's famous 1905 Special Theory of Relativity which modified the space and time of Newtonian physics. Modern physics has since been built to be consistent with special relativity. We solve the mystery of the motion of light and from this solution a new theory emerges which challenges that of Einstein. Our theory also serves to show that Einstein's arguments, using which he derived his major physics

conclusions, were based on unstated assumptions and therefore not a valid path to his conclusions.

Most importantly, our theory is urgently needed at this time because of recent experimental failures of special relativity in certain cases. We explained in our 2005 paper titled "Space is discrete for mass and continuous for light" that special relativity would fail these specific set of tests. The results of these experimental observations are a failure for special relativity but are in line with our theory, and confirm its predictions.

Let us start with some basics, and then quickly get to the matter of motion of light.

In physics, for any observer we can assign a frame of reference. As an example, for a person standing on a road, the road is the frame of reference and the person will make measurements relative to the road. For a person in a car moving on the road, the car will be the frame of reference and the person standing on the road will be moving in the car's frame of reference but persons sitting in the car will be at rest in the car's frame.

Special Relativity considers two observers who are at rest in their *inertial* frames of reference. Inertial frames move at constant velocity with respect to each other. If there was acceleration between these frames they would not be inertial frames of reference. We take the term inertial frames exactly as defined in special relativity, and so we need not further address here any technicalities of what an inertial frame is.

Special relativity dramatically broke from classical (i.e. Galilean-Newtonian) physics because of below postulate.

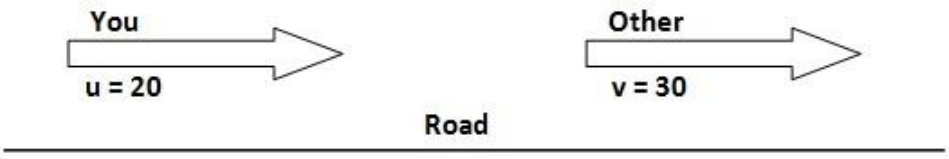
Light postulate: The speed of light has the same value in space in all (inertial) frames of reference.

The other postulate of special relativity was nothing new and states what was already known from Galilean-Newtonian physics: The laws of physics are the same in all (inertial) frames of reference.

The experimental evidence for the light postulate is overwhelming, and there are no credible experimental results against it. Our theory agrees with both the postulates and thus the experimental evidence in favor of the postulates also supports our theory. (The experimental failures of special relativity that we mentioned above are for other parts, where our theory diverges from special relativity). What is dramatic about the light postulate is that it contradicts "Galilean relativity" of classical physics and also "common sense." Let us first review this part of classical physics. As we know, velocity is just speed with direction specified, so for our purposes of discussion we can interchange one for other.

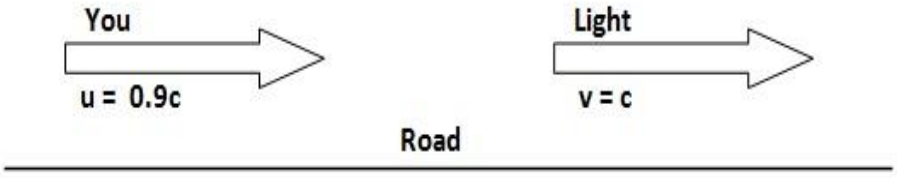
We consider two cars moving on the road. Commonly, when we say a car is moving at a certain speed we refer to its speed relative to the road, and that is what we mean here. We can skip the units of speed. One car is moving at 20 and other at 30 in the same direction as shown. We refer to the occupants of the cars as You and Other.

You are going to the right at u=20. Other is going to right at v=30.



According to classical physics, You will see the Other car going to the right at v'= v – u = 30 – 20 = 10 relative to you. And, of course, this classical velocity addition makes perfect sense from experience because Other is 10 faster than You. But to make the light postulate hold true, it can be shown that all velocity additions have to change, so this answer of 10 is not perfectly accurate, but at speeds much slower than light the error is miniscule.

Now suppose You are going to the right at 0.9 times the speed of light, u = 0.9c, and the Other you are observing is Light, v=c.



Then by classical physics You would see Light going at v' = v – u = 1c – 0.9c = 0.1c relative to you i.e. light will be faster than you by 0.1 c. But according to above light postulate of special relativity all observers always see the speed of light to be the same. That means, no matter speed what You are moving at, you will see light to be moving to the right at 1c. Even if You increase your speed to, say, 0.999999c, you will observe light to be travelling at 1c. So classical physics and the "common sense" expectation that you would be catching up to light and therefore would see light at 0.1c is wrong!

How did Einstein explain this strange situation? How can an observer's speed not matter when you are looking at light? Einstein had no direct explanation, no mechanism, and no details of what makes this happen. But he never sought an answer to such queries and simply assumed this and called it a postulate. It often is the situation is physics that we have discovered something we can experimentally confirm, and that is where the physics of the situation ends. If one could answer further "how" and "why" something holds true then that could be new physics.

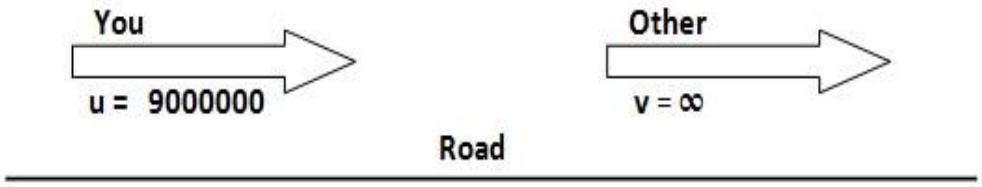
We actually give below the "how" and "why" which Einstein not was able to provide, and that does lead to new physics; in fact, it leads to new equations which are different from and contradict those that Einstein found. To understand our answer to the "how" and "why" of the light postulate let us detour back to classical physics – forgetting about special relativity – for a moment only.

Special relativity also says (correctly) that no mass can travel faster than speed of light. So we absolutely need to announce that we are taking a momentary hypothetical detour from special relativity only for the purpose

of visiting the concept of infinity (∞).

In mathematics, when you add or subtract a finite number from ∞, you still get ∞. For example, ∞ - 4700000 = ∞ and ∞+ 99999999999999 = ∞.

Then applying this rule of mathematics to below diagram, no matter how fast a finite speed You have, you will always see Other travel at ∞.



In above v' = v – u= ∞ - 9000000= ∞. The answer, in classical physics, would be ∞ whether you had u = 9000000 or u = 99999999999999 or any other finite value.

So, in classical physics:
When You, the observer, are looking at an object travelling at infinity (∞), your own (finite) speed does not matter. You will always see that object travel at ∞.

Compare to special relativity:
When You, the observer, are looking at light, which travels at c in empty space, your own (less than c) speed does not matter. You will always see light travel at c.

In relativity, light is behaving the way an object moving at infinite velocity would in classical physics, in that the speed of the observer does not matter. For light to so behave there should, in our view, be a hidden infinity in the mathematics of relativity which corresponds to the speed of light. We parted from Einstein and actually found this hidden infinity in the mathematics of velocity addition.

In physics we have the famous notions of "quantum jump" and "discreteness." These come from quantum mechanics, where at small scales things are not continuous but "granular." Many physicists have been suggesting a lattice structure for space, or some other way whereby space takes on a discrete character. But giving space such structures would not explain "how" and "why" of the light postulate and tell us where the hidden infinity in the mathematics of the motion of light is which causes the speed of the observer to not matter.

In classical physics and in the theory of relativity all motion is continuous. In our theory we abandon continuous motion for mass and thereby unite relativity with the discrete nature of quantum mechanics. However, very importantly, we hold on to light (or massless particles) having continuous motion. Mass moves through space discretely, "jumping" from one point to another without passing through the points in between.

On the other hand, the motion of light through space is continuous.

For mass travelling at constant velocity the "length jumped" is constant. The higher the velocity the more the number of jumps per unit time and the smaller this jump length. Note that these jump lengths are all very small. They match the length scales we see in quantum mechanics, which are of atomic length and smaller. At the quantum scale a fundamental length is called the Planck length, after physicist Max Planck, and it is 10^{-35} m (which is a decimal point followed by 34 zeros and then 1).

Now let us look at a stretch of space that mass and light are moving through. In a unit time a point mass particle moving at constant velocity will be at a finite number of points and have made a finite number of jumps; in this time light will travel continuously over all points in its path and effectively have made an infinite number of jumps. Thus we have the hidden infinity we needed.

In our theory, addition of velocities depends on adding (or subtracting) the number of jumps per unit time. The number of jumps per unit time is infinite (∞) for light and finite for an observer having mass. When an observer looks at light, addition and subtraction will involve adding or subtracting a finite number from ∞ and the result will still be ∞. Thus the speed of the observer will not matter and that is what explains the light postulate.

Let us actually go further into the mathematics – all of which is elementary – and show how this works. We will show precisely why the light postulate holds true. Given what we are achieving do follow the simple math. (If you want to not join us in this then skip the below paragraphs having mathematical notations and continue reading after that. Understanding of this mathematics is not needed to read the other chapters).

In a unit time a mass particle with constant velocity would have made N jumps. N need not, of course, be a whole number (what that means is that if, say, a particle makes 10 jumps in 4 seconds then we say N=2.5 jumps per second, but the particle makes whole jumps only). Each jump length is Ld where L is a length that is a constant for space and d is a function of N. (A function is a formula; while one can see our paper for the formula, it is not needed for our purposes here). We can think of d as a function that causes "shrinkage" of the jump length. The distance the particle travels in unit time is v = NLd, which comes from multiplying the jumps per unit time N by the length of each jump Ld. For simplicity we can take L = 1 and have v=Nd (but if we use the shorter formula for v must keep in mind the L=1 or we will be missing the distance unit from the formula). Note that since d is function of N it would mean v itself is a function of N. Every velocity v corresponds to a N. Our formula for velocity v is such that as v of the mass particle increases, N gets larger, but d decreases in such as way that v approaches speed of light, c, but never crosses c. So that also explains why no mass can travel faster than c.

For light, as explained above, continuous motion means N = ∞, and we have jump length d=0.

Mathematically, the actual product of ∞ and 0 is deemed to be indeterminate, which here would mean it can be any number. However, for motion in space this indeterminate is fixed and we have ∞ • 0 = c. All continuous motion in space is at this speed.

In our theory, addition of velocities depends on converting the velocities to number of jumps per unit time, adding (or subtracting) these number of jumps per unit time, and then converting the result back to velocity. All this is done using formulas we have found. Let us apply the method to You as an observer viewing Light. As

in earlier example, we again take Your speed to be u = 0.9c and for Light we have v = c. Corresponding to them we have jumps per unit time N_u and N_v, where N_u would be a "finite value" (which we can calculate using our formula) whereas $N_v = \infty$. In classical physics we add or subtract velocities v and u directly. Here we add or subtract the N's. For case when You are observing light we have $N_v' = N_v - N_u = \infty$ - "finite value" = ∞. From $N_v' = \infty$ we will get d'= 0 and and from our formula, with these values of N_v' and d' we get velocity $v' = N_v' \bullet d' = \infty \bullet 0 = c$. This explains the light postulate.

Infinity "naturally" occurs in many places in physics and we have embraced it and gotten the light postulate. However, infinity has traditionally been considered an enemy by physicists. Physics dogma teaches that infinity should be avoided, and if that is not possible, then it is to be confronted and eliminated. So physicists would never do what we did above by seeking out and working with ∞. Thus they could never explain the light postulate and simply assumed it. Physicists have been avoiding or fighting infinity for a hundred years and the methodologies that have been laid out for future physicists seem to have put physics on course to continue avoiding infinity for another hundred years.

Another long-standing dogma in physics is to put distance and time as primary physical quantities, with velocity (speed) derived from them. This comes from dimensional analysis which is taught as a foundation to physics students. In line with this, Einstein was focusing on obtaining distance and time equations. But the fundamental fact of relativity is that all observers see light at the same speed, no matter what the observer's own speed. Given that this physics truth, which forms the starting point of relativity, is about velocity we found it natural to examine velocity directly.

Starting with velocity is our deliberate approach for another reason too. When looking at moving objects we can directly observe velocity and directly observe distance travelled. We can actually see how fast something is going and from which point to which point it is moving. Time, however, is subtle and elusive in that time "flow" cannot be directly observed, unlike velocity and distance. For us, in that sense too we would rather have velocity and not time as the quantity we prefer to work with as a starting point. This simple realization worked wonders. In fact we never needed to assume the light postulate, since by going directly to velocity we have above shown how and why it is that all observers measure the same speed of light. Having gotten equations for velocity we use them to then get equations for distance and time.

Einstein's equations of special relativity are called the Lorentz transformations, after physicist Hendrik Lorentz who first stated them. From our equations of velocity, we derive equations for distance and time. Of course, because our equations of velocity addition are different from Einstein's, our distance-time equations also come out be different from the Lorentz transformations. We got the correct equations using velocity as a starting point for the equations and Einstein got the Lorentz transformations by choosing to go directly to distance and time, and then from those equations coming to equations of velocity addition.

However, for momentum we get the same effective formula as Einstein's and this also results in the same energy formulas. So that part is common between the theories. Using his interpretation of special relativity physicist Stephen Hawking writes, in *A Brief History Of Time*: "As an object approaches the speed of light, its mass rises ever more quickly" [ ]. Physicist Brian Greene similarly states in *The Elegant Universe* that mass of a particle "increases without limit as its speed approaches that of light" [ ]. We never agreed with such interpretations of Einstein's formula. We note that for momentum we get the "same effective formula as Einstein's," the "effective" word being important because the formula is not exactly the same. We are glad that

there is no possibility of interpreting our formula to suggest that mass is actually changing with velocity.

Time dilation and Length contraction are two major predictions resulting from the Lorentz transformations.

Physics books and papers repeatedly state that time dilation has been experimentally confirmed. Despite what physicists think and claim, time dilation – that time *itself* dilates – has never been shown to be true; to show it to be true we need to simultaneously test it across multiple clock mechanisms and that has not been done. Clocks are mechanisms that are affected by motion, and by gravity and other forces so they show different times when these differ. Our equations also lead to different time measurements by observers. However, unlike special relativity, in our theory, the ratio between the time measured by the two observers takes into account the mechanics of the event being measured. In our theory different clock mechanisms observed by the same two observers could give different time ratios. Special relativity has a time dilation formula that applies between the inertial frames of the two observers. Using this formula, the ratio of time rates between clocks in the two inertial frames is computed from the relative velocity between the frames. This formula has been tested multiple times using atomic clocks. In special relativity the ratio between the time measured by observers in these two frames will have this same computed value, no matter what the clock mechanism or the event being measured. So to confirm this we need to simultaneously test with different clock mechanisms and show that time dilation remains the same irrespective of clock mechanism. Unfortunately for special relativity, as we discuss below and in full detail in chapter 3, it has already been shown that natural cosmic clocks – quasars being an example of a such a clock – behave differently than atomic clocks when it comes to time dilation. So special relativity has failed this test involving different clock mechanisms!

Length contraction has not been experimentally tested at all. In our theory length of an object remains invariant, and there is no length contraction. We consider length contraction to be one of the strangest claims in the history of physics, and we have always felt that special relativity came with an expiry date because the day length contraction claim is experimentally tested would be the day this theory falls. Many in physics look only at the mathematics of a physics theory and they can correctly point out that, mathematically, there is no problem with length contraction. But we are talking physics, and we doubted it was physical reality. What is special relativity's length contraction? From the Lorentz transformations it follows that length of an object moving relative to you contracts parallel to the direction of motion. Suppose Other and You both have a measuring stick of same length. Other gets into a very fast vehicle and zooms past You; assume that both sticks are aligned parallel to Other's direction of motion. As Other passes You, you will notice that Other's stick is shorter. At v = 0.866c Other's stick would have contracted to half the length of your stick. It is not just the stick, Other's vehicle and everything in it will all contract parallel to the direction of motion. And, of course, this happens all the time as people move relative to each other, except that the contraction is so small at everyday speeds that you cannot observe it.

We have noted that in the path to the Lorentz transformations Einstein chose to avoid infinity and chose to start with distance and time. Einstein followed two other paths which we consider erroneous. These two other erroneous paths were adopting the linear thinking of Newtonian physics and also adopting the wrong philosophy of time based on a possible misunderstanding of time in Newtonian physics. We discuss these further in the next chapter.

So, by our equations, have we shown Einstein's relativity equations to be wrong? No, only experiments can do that, and they have done so. Independent of experiments, what we have theoretically done, using simple

mathematics, is to give a counterexample to Einstein's claim that special relativity's two postulates necessarily lead only to his equations of special relativity. Einstein's famous 1905 paper had a "derivation" that showed how the postulates necessarily led to the Lorentz transformations. Einstein's derivation of the Lorentz transformations from the postulates was based on unstated assumptions, and thus was not a derivation at all. That derivation is widely accepted and celebrated. Following Einstein's thinking, various derivations of the Lorentz transformations have since been published, and this link between the postulates and the transformations is a cornerstone of relativity. This derivation is taught as part of a standard college course in modern physics. Reputable physics textbooks derive the Lorentz transformations, in a claimed mathematically rigorous manner. Numerous physics papers that review or discuss relativity similarly accept that the Lorentz transformations can be derived from the postulates; popular books and articles on the subject repeat this claim.

Einstein's derivation meant that it has been mathematically and rigorously shown that A (the postulates) necessarily implies B (the Lorentz transformations). Physicists have studied and checked this derivation thoroughly for over a 100 years. But, as philosopher Thomas Kuhn noted in *The Structure of Scientific Revolutions*, physicists normally strive to preserve rather than try to refute their foundational theories; so it should not be surprising that all of them would find the derivation to be correct. It is this "derivation" which we have shown to have been based on unstated assumptions and thus not a valid derivation. We have achieved this because we found a counterexample C (our new equations) that shows that A does not necessarily imply B but can equally well imply C.

We are not questioning that the postulates of special relativity are correct, and in fact we are in full agreement with them, having actually explained the light postulate. We are questioning the Lorentz transformations. There are two issues to be decided:
(1) Whether, by having a counterexample, we have shown that Einstein's derivation was invalid. Three Nobel Prize winners and others have reviewed this counterexample and none have been able to state that we do not have a counterexample. But physics authorities do not like that we have succeeded in showing that Einstein's derivation was invalid – in fact they do not like it at all!
(2) Whether B (Lorentz transformations) or C (the Equations we found) are the correct space and time equations. These two sets of equations make different experimental predictions and experiments are the way to show that relativity is wrong and that Lorentz transformations are not reality. Lorentz transformations have failed the test involving different clock mechanisms..

We have shown that Einstein did not have a derivation of the Lorentz transformations, and we believe physics professors should therefore stop teaching that "derivation" as part of their standard modern physics course. In fact we emailed many professors asking them to stop teaching the derivation because it is not a derivation at all. It was our suggestion that when they teach the Lorentz transformations they should skip the derivation part since one "cannot logically or ethically teach a derivation to which a counterexample exists." But, in physics, as in religion, just because something is factually incorrect does not mean the proponents will stop teaching it as true. Physics is run by authorities who today share a great faith in special relativity, and physics professors teach what the authorities have dictated to be taught to students. Today's high priests of physics will not allow a refutation of special relativity, and professors do not seem to be bold enough to discuss the objectivity and judgment of those in power. They cannot challenge the wishes of today's physics authorities regarding special relativity, even when armed with a counterexample to Einstein's derivation. That Einstein's derivation is scientifically not correct is seemingly not a good enough reason for physicists to challenge

authorities and not to teach the derivation to students. Looking for potential whistle-blowers who can tell their physics departments that they will not teach an incorrect derivation has been futile.

Special relativity has now experienced experimental failures. Einstein noted that "a single experiment can prove me wrong." The Quasar Time Dilation Failure of special relativity [ ] is an experimental failure that professors in classrooms never mention when they indoctrinate their students with the belief that special relativity has passed all experimental tests. Actually most professors who teach special relativity would not even know about such failure of relativity. It is a result that the physics authorities have suppressed so well that even I, who keeps on top of experiments regarding relativity, found it out only by good fortune while looking for other information related to quasars.

Professors who compile or disseminate on experimental status of relativity – examples are Professors Clifford Will and John Baez and we give more detail later in the book – do so on a biased basis, which always carries the message that special relativity has passed all tests. We have already mentioned suppression of the time dilation failure of special relativity. Beyond that such professors, and at least these two in particular, love to throw the word "crackpot" at those who question special relativity. In our view, there perhaps can be no greater crackpot than a professor who provides and disseminates a compilation that continues to spread misinformation on experimental status throughout the world. Professors Baez and Will are two such notorious relativity worshipping crackpot professors.

In chapter 3 we examine experimental failures of special relativity and give further experiments that can differentiate between the theories and show relativity to be wrong; we include a suggestion on how to test length contraction.

There is further specific reason why physics authorities are hostile to our equations as a replacement for relativity. In physics when a new theory has the old theory as a limiting case there is a smooth transition. For example, as speeds fall lower to being much less than speed of light, special relativity's Lorentz transformations give results increasingly close to Galilean-Newtonian physics , so Galilean-Newtonian physics is a limiting case. Our equations are also such that Galilean-Newtonian physics is a limiting case. But there is a clash between our equations and the Lorentz transformations in that neither is a limiting case of the other. If our equations are right, this would make things very bad for physicists who have unquestioningly built on the Lorentz transformations for over a 100 years. There would be no smooth transition.

How bad can things be if special relativity were to be replaced? Let us look at the parts of special relativity. One is the postulates, and another part is the Lorentz transformations. Much of modern physics is built on postulates being correct and that part is not affected; however, much of modern physics is also built on explicitly assuming the Lorentz transformations to be true. For that part there would be a big problem. The Lorentz transformations are the basis for the new spacetime equations that replaced that of Newtonian physics, so special relativity's spacetime is history if they do not hold true. For momentum we get the same effective formula as special relativity and this also results in the same energy formulas, so that part survives.

But there is another looming problem based on the other relativity – the wide adoption of Einstein's theory of gravitation, general relativity, in recent decades. General relativity's "curved" spacetime is founded on the spacetime of special relativity. Physics authorities truly admire general relativity's spacetime and its mathematics, and have been justifying their faith claiming experimental successes of general relativity. In this

book we also devote further chapter to general relativity and additional problems with its assumptions and foundations (besides its being based on special relativity). We will show how meager, and far from definitive, general relativity's experimental successes have been and go through the history of how these have been hyped, while suppressing its grand failure. We note that special relativity has had no competitor, except our theory, that perfectly preserves both its postulates. On the other hand, general relativity, though the clear favorite of physics authorities, is far from being the only theory of gravitation.

General relativity requires the existence of gravitational waves, which would travel at the speed of light. LIGO gravitational waves observatory, starting 2015, has claimed detection of waves from black hole collisions, where the observed waveforms almost-perfectly matched the expectations calculated from general relativity. In later chapters we go into detailed examination of the loose ends of LIGO's experimental claims regarding black holes and show that things are not the way they are being presented to the public by officials. That massless particles (or waves) move at the speed of light while massive particles move slower is, as above, a foundation of our theory and thus is certainly not unique to special and general relativity. We do not offer a theory of gravity in this book but we note that one of the implications of the Lorentz transformations being wrong would be that the spacetime equations of general relativity, unfortunately, would also be foundationally wrong.

Quantum mechanics is a theory which is very successful at explaining the behavior of mass and light at the atomic and subatomic scale. General relativity is incompatible with quantum mechanics, and we believe this is because relativity's spacetime is not reality. That, we believe, is the message from the incompatibility, and the resolution is to replace relativity entirely, starting with the Lorentz transformations. But that is not the opinion of physicists in power! Quantum gravity attempts to unite quantum mechanics with general relativity (gravity), and thus the name. Quantum gravity has become the great physics challenge, with String Theory and Loop Quantum Gravity as the leading approaches. Quantum gravity theories – which have become the main pursuit of theoretical physicists in recent decades – are based on the mathematics of the spacetime of special and general relativity and these theories would become a wasteland if the Lorentz transformations of special relativity were foundationally wrong.

Another big field that has emerged is cosmology. Much of cosmology is built on increasingly complicated theories founded on general relativity, but cosmology also connects directly to special relativity. In chapter 3 we discuss in detail how cosmology's foundational premise that the universe is expanding – which we believe to be true – is now actually being contradicted by multiple observations related to measurements of special relativity's time dilation in celestial bodies. In an expanding universe cosmic objects such as quasars, which serve as cosmic clocks, would be moving away from Earth and would show time dilation according to special relativity; but since no time dilation is being measured this means that special relativity is informing us that the universe is not expanding. Professional scientists and amateurs with interest in science many not know about these conflicts between special relativity and the expanding universe model because physics authorities and the science media have been ignoring and suppressing this emerging contradiction between these two foundational paradigms. In our theory cosmic clocks such as quasars which are moving away from Earth as a result of the expanding universe would show no time dilation, but other types of clocks would – which is as observed. Thus our theory is consistent with an expanding universe.

Physics has put all its eggs in one basket with their faith in special relativity and on general relativity, which rests on special relativity! Thus there is good reason why physics authorities want our equations as well as the

failure of the Lorentz transformations of special relativity suppressed forever. The fall of special relativity would wipe out the theoretical life work of physics authorities and of so many others, which is all based on absolute faith in special relativity.

It has been thoroughly tested that the speed of light in space always remains the same, and thus the light postulate is true. However, physicists have not done the full spectrum of critical experimental testing of the precise claims of the Lorentz transformations and part of the testing done has produced experimental failure. Yet there is a near-absolute belief among physicists that Lorentz transformations are true. How did this happen? We believe there are four major reasons for this:
(1) suppression of failure of the time dilation of the Lorentz transformations by physics authorities and their media partners
(2) verification of the postulates being wrongly assumed to also mean a verification of the Lorentz transformations since physicists believe that Einstein showed, through his derivation, that if the postulates are true then so are the Lorentz transformations
(3) lack of another theory consistent with special relativity's two postulates which could push for testing between the equations and predictions of the theories
(4) ignoring any and all facts that go against the Lorentz transformations, physics authorities and the media work to hype these equations as true, with all of them competing with each other at every turn to emerge as the greater champion of the theory; through such methods they have achieved near unanimous belief.

With all the hype about special relativity by the physics establishment, the message is clearly received by all physicists, and absorbed by those just starting a career in physics, that special relativity is something you praise and not question – unless you are a crackpot! And part of the praise is to repeatedly recite the mantra that special relativity "has passed all tests," no matter what the facts. All of professional physics sang this official line across the world at the centenary celebrations of Einstein's 1905 special relativity paper. It is not that everyone in physics has learnt to adopt a suppression methodology when it comes to special relativity. It is that physics authorities like to keep their professors, teachers and students ignorant of objective scientific truths, as a result of which they, along with the public, believe and recite that special relativity "has passed all tests." Throughout history people have often come to power in government, church and other organizations who excelled in the art of keeping their own members ignorant of reality, as a part of larger scheme of keeping the public unaware. Physics today is under control of such authorities.

Our counterexample to Einstein's derivation is also being suppressed by authorities, with three Nobel Prize winners – Steven Weinberg, Gerard 't Hooft and Frank Wilczek – commenting on our paper but evading the question of whether we have a counterexample. Either our equations form a counterexample or they don't. How much simpler in its thesis and in its invite to find a flaw in the technical arguments could a paper be? If there was no counterexample they would surely have pointed that out with glee. In a later chapter we document their comments, as well as those of others.

Physicists in power who practice evasion and suppression regarding facts and reason that challenge special relativity may have fears about its future, realizing that the suppression methodology and propaganda, though very successful today, might not be a reliable means of assuring a permanent status quo. But their worst case imagined scenario has been the possibility of a replacement theory that limits down to the Lorentz transformations. To not have the Lorentz transformations be a limiting case of any replacement theory would be a crash of today's physics, and this possibility is beyond their imaginations. After all, even the Lorentz

transformations have Galiliean-Newtonian equations as a limiting case, which allowed for a continuation in that the older equations are still used today, except when very high speeds are involved. In our view, nature is pointing so a crash where the Lorentz transformations and all that rests on it will be eradicated foundationally. But physics authorities will not allow such a crash. So poor physicists across the world have to continue to indefinitely work with and build on the Lorentz transformations, even if these equations are wrong. What a waste of taxpayer money and their lives!

Physics is a field where a privileged few decide the course, and the masses follow. And these few today, in our opinion, are not making good and honest decisions. Do all fields, and indeed the whole world in its numerous parts, function this way? Is all decided by the few in leadership? We believe that is quite possibly how things largely function once a leadership is established in a field. The process of establishing or changing leadership can be more diverse, depending on the field, and we do not want to go into that here. (We briefly point out leadership does not automatically come from title but needs having vast majority who approve of the leadership, substantial length of time in power etc.). How do the masses, or members of a group, behave when compared to the behavior of those in leadership? We believe the answer is that masses largely emulate the behavior and walk along the paths the established leaders choose. So perhaps a field, particularly an intellectual field, can work wonderfully when the privileged few in control are honest and objective, because the masses will emulate these standards and behavior. Similarly an academic field gets on a path of dogma when suppression of truth is practiced by those in power, because the rest will also walk the path of ignoring and suppressing inconvenient truths. Is leadership in science fields traditionally more ethical and objective than that in other fields? Whatever the answer, it does not help us deal with the situation – such as that in physics today – where a field of science experiences a substantial decline in ethics and objectivity.

Max Planck, considered to be the originator of quantum mechanics, noted: "A new scientific truth does not triumph by convincing opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it" [ ]. So physics and science has this general problem of scientists sticking to wrong scientific beliefs and not accepting that they are wrong despite the objective evidence. But Planck and his colleagues, which included Einstein, were never worshippers and suppressors. Today, in contrast, just as zealots and fundamentalists of one religion will not look at contradictory material from another source, relativity worshipping physics authorities will not consider alternatives that do not limit down to special relativity.

Biased media has played a big role in hyping relativity and in suppression of its shortcomings, and we will discuss this in detail in a later chapter. Consider the quasars time dilation failure. Almost all of science media and all of general media refused to report it – and these same news outlets report every experimental success of relativity worldwide. To get this quasars bad news one would have had to read *New Scientist* magazine or *Phys.org*; these two have often published facts that the rest, seemingly bowing to the wishes of physics or other science authorities, suppress. But not all media would need physics authorities to pressure them into such suppression, because for a large number of news outlets hyping relativity been a long-term independent policy, and disseminating bad news about special relativity would not be consistent with that policy.

Suppression is unfortunate but it is reality in physics today when it comes to theoretical and experimental problems with relativity. Is such suppression methodology consistent with traditional methodology of science? We believe that philosophers and historians of science have missed the important truth that the nature of science, which includes the methodology of science, is variable and depends on those who hold power in the field at the time. Today's powers-that-be in physics are relativity worshippers and suppressors, breaking from

predecessors who shunned such behavior. One effective methodology physics authorities have adopted is dismissing and branding all who challenge the foundations of relativity, including those who use proper and rigorous scientific methodology, to be crackpots. So today suppression is a key methodology of physics when it comes to relativity. But tomorrow, possibly with regime change, the methodology of physics may change with an objective and idealistic government in power which does not worship relativity and which shuns suppression.

Philosopher and physicist Thomas Kuhn, mainly using examples from physics, noted that the great respect for "authority" and "orthodoxy" in science "distinguishes it from every other creative pursuit except perhaps *theology*" (italics mine) [ ]. Philosopher Paul Feyerabend called science the "*most aggressive, and most dogmatic religious institution*" [ ] asserting that "science has now become as oppressive as the ideologies it had once to fight" [ ]. In an article [ ] whose purpose was to challenge and criticize philosophers like Kuhn and Feyerabend, Nobel Prize winning physicist Steven Weinberg sums up his view of scientific reality:

> There is a "hard" part of modern physical theories ("hard" meaning not difficult, but durable, like bones in paleontology or potsherds in archeology) that usually consists of the equations themselves, together with some understandings about what the symbols mean operationally and about the sorts of phenomena to which they apply. Then there is a "soft" part; it is the vision of reality that we use to explain to ourselves why the equations work ... But after our theories reach their mature forms, their hard parts represent *permanent accomplishments* ... I think that Kuhn overestimated the degree to which scientists during a period of normal science are captives of their paradigms. There are many examples of scientists who remained *skeptical about the soft parts* of their own theories [italics mine].

As Weinberg implies in above note, there is no skepticism of equations parts of established theories because they are deemed to be *permanent accomplishments*. Kuhn pointed out that physicists do not like to refute their foundational theories. What Weinberg notes in his experience is actually consistent with what Kuhn says, because if physicists are not going to be skeptical of established equations they obviously will not try to refute them. And physics is centered around equations. However, while appreciating many of Kuhn's insights, there are certain conclusions of Kuhn that we do not accept and where we agree with his critics, as we explain in following chapters.

Though we disagree with above quoted blanket statements that Feyerabend makes about science as a whole, we believe he does properly characterize the field of physics *as it behaves today when it comes to special relativity,* in that physics actually functions as an "oppressive" and "dogmatic religious institution" that suppresses valid problems with its holy equations of special relativity and their foundations.

Physicists have not attempted to rebut our proper and rigorous scientific counterexample to special relativity using reason and intelligence; instead, anger, evasion and refusal to address the specifics has been the general reaction of relativity worshipping physics authorities. It would seem most of today's physicists have only religiously memorized and never tried to question or refute Einstein's derivation, so they cannot address such challenges to foundations. In a later chapter we will give more details of our experiences with physics

authorities as well as devote more space to discussion of philosophy of science, religion, authority and blind faith. We will also look at the evolving roles of Vatican authorities and physics authorities, and discuss how the old Vatican methodology of preventing dissemination of scientific reality has been embraced and aggressively put to practice by today's physics authorities. We note that in recent decades, Vatican authorities have been becoming open to acknowledging scientific facts that go against their beliefs, while physics authorities have become "most aggressive and most dogmatic" regarding protecting their beliefs in special relativity by shielding their believers from objective and verifiable scientific facts against it.

We live in a special time in physics history because never before (in the post-Galileo period) has there been such authoritarian religious worship of a theory and suppression of facts against it. It is for this reason that we call today's physics establishment the relativity worshipping Church of Physics. (In this book, we use "church" as a generic word for a place of worship or religious organization).

Leave Feedback

Preview of Chapter 2. Foundations of the Spacetime Equations of Special Relativity: Einstein's Derivation From the Postulates was Based on Unstated and Wrong Assumptions, and Thus Was Not a Derivation at All

We continue the discussion in the previous chapter of Einstein's path to the Lorentz transformations. Since we have a counterexample to Einstein's derivation of the Lorentz transformations from the two postulates of special relativity, we already know that his derivation of the Lorentz transformations cannot be correct. Einstein chose to avoid infinity and chose to start with distance and time. These were already two choices made about what path to follow or not follow. By not considering, or not being aware of, alternative paths he had already made unstated assumptions about what paths are available. A derivation based on such unstated assumptions is not a valid derivation.

But let us examine some of the other unstated assumptions Einstein made that led him to the Lorentz transformations. Again, the Lorentz transformations replaced the equations of Galilean-Newtonian physics (which for short we will call Newtonian physics or classical physics in this chapter).

Einstein followed the standard interpretations of Newtonian physics in matters of speed and time, and reached certain conclusions. These conclusions then formed the basis of unstated assumptions.

Let us pause here to review this task of finding unstated assumptions made by Einstein that we have taken on. Is this how theoretical physics functions? Further, are we out to also prove that even prior to the matter of the constancy of the speed of light, Newtonian physics, by itself, was wrong in its conclusions?

Let us answer the second question first. While we can argue about interpretations of speed and time in

Newtonian physics, such arguments remain philosophical and do not attempt to change the laws and equations of Newtonian physics. However, carrying over conclusions about speed and time from Newtonian physics has serious implications for the new situation regarding what sets of equations follow from the constancy of the speed of light.

Now let us address the first question. Looking for unstated assumptions in foundational theories is not how theoretical physics functions because physicists normally never attempt to refute foundational theories. In particular special relativity and Einstein's reasoning on which its equations are founded has been declared by physics authorities to be beyond question. But, as some others and I believe, determinedly looking for wrong or unstated assumptions in foundational theories should be part of what physicists do. Who are the others who so believe?

Physicist Lee Smolin is one and his book, The Trouble with Physics, suggests that there might be "some wrong assumption we are all making" and "someone needs to find that unexamined assumption" [ ]. Lee Smolin and his research partner Carlo Rovelli have become the public face of loop quantum gravity, which is one of the two major paths attempting to unite general relativity (gravity) with quantum mechanics. What attracted us to loop quantum gravity was that a few people within it were, like us, interested in discrete motion and were boldly trying to modify special relativity. These rebels, who would modify special relativity, are mainly from Europe and Smolin (who is American) suggests that such pursuit would not have earned them a position in American physics. What was of most interest to us was that these physicists were looking to modify special relativity's length contraction, by having observers measure equal lengths at small scales. We certainly shared their desire to modify length contraction and, as mentioned in chapter 1, our theory entirely removes length contraction. But our theory does not share the fundamental principle of loop quantum gravity that space itself has a discrete structure with a minimum length. As we saw in chapter 1, in our theory light moves continuously through space and, for mass, discrete motion has jump lengths that become smaller as speed increases and get infinitesimally (i.e. arbitrarily) close to zero. Further, our mathematical explanation of "how" and "why" of the light postulate will not allow any violation of the constancy of the speed of light, whereas the discrete structure of loop quantum gravity and other such suggested modifications of special relativity involve slight violations of the constancy of the speed of light. Their proposed equations that would replace the Lorentz transformations were mathematically complicated, and we believe this results from these theorists putting on themselves the restriction that their equations must have the Lorentz transformations a limiting case.

Another group that was of interest to us had Alan Kostelecký at its major proponent, and these comprised mainly experimentalists that were looking for "Lorentz violations," as a means to extend what is the known as the Standard Model of particle physics. But what they called a search for "Lorentz violations" was mainly a search for violations of the postulates of special relativity and not a test of the equations which comprise the Lorentz transformations; however, for them both were the same since they believed that testing the postulates is equivalent to testing the Lorentz transformations. Our theory states that the two postulates hold true but that the Lorentz transformations do not.

Both the quantum gravity and the standard model extension folks agreed with Einstein's reasoning, as did the world, that the two postulates *necessarily* imply the Lorentz transformations. So they were looking for modifications of special relativity, but with the restriction that the equations of any new theory would limit down to the Lorentz transformations. We did not agree with Einstein's reasoning and conclusions and thus felt no restriction to have the Lorentz transformations as a limiting case. So we were happily alone in looking for a new theory whose equations would have Newtonian physics as a limiting case, and that would entirely replace the Lorentz transformations rather than continue to maintain them as the foundation our theory must link to. If we succeeded, what would get the theory immediate recognition (we expected and hoped) was that, by finding such new equations which are consistent with the two postulates, we would have a counterexample to Einstein's derivation. Existence of a counterexample would be immediate proof – no experiments needed – that Einstein's reasoning was, in fact, wrong. We did succeed finding a counterexample, exactly as we hoped. But then began a struggle with the suppression methodologies of the authorities of the relativity worshipping church of physics. Let us continue with the science below and come back to church authorities later.

The task we had taken on was to show that link between the two postulates and the Lorentz transformations is not a valid one. Accepting Einstein's derivation of the Lorentz transformations from the postulates, and not finding the unstated assumptions that form its basis, is where modern physics went wrong! We continue analyzing those unstated assumptions below.

Einstein followed this seemingly infallible logic: since speed=distance/time the only way speed of light would remain same when measured by different moving observers is if there existed formulas by which distance and time measurements changed between the reference frames of these observers. We quote from the book *The Evolution of Physics* by Albert Einstein and Leopold Infeld) [ ]: "If the velocity of light is the same in all [coordinate systems], then moving rods must change their length, moving clocks must change their rhythm, and the laws governing these changes are rigorously determined." The "laws" are the Lorentz transformations and Einstein's derivation purported to show them to be "rigorously determined." This unstated and wrong assumption about speed was central to Einstein's thinking; such assumption follows from thinking along the lines of 'linear' foundations of Newtonian physics. This assumption and logic is accepted by all physicists and is used as a means to explain Einstein's derivation. Lee Smolin discusses this logic in his book, *The Trouble with Physics [ ]*:

> The key is that we do not measure speed directly. Speed is a ratio: It is a certain distance per a certain time. The central realization of Einstein is that different observers measure a photon [light] to have the same speed, even if they are moving with respect to each other, because they measure space and time differently. Their measurements of time and distance vary from each other in such a way that one speed, that of light, is universal.

Einstein's above conclusion that for different observers to measure light to have the same speed it is *necessary* that observers measure lengths in space differently was wrong. We can argue if we rearrange and put time=distance/speed then speed is no longer a ratio and time becomes the ratio, and then it is time and not

speed that we can supposedly claim to not measure directly. The relationship between time and speed and whether one, and only one, should be considered the primary physical quantity is an interesting philosophical question. Time, and not speed, being a primary quantity is a dogma which we explicitly rejected in chapter 1. There we gave our simple reasons why, in our theory, we "have velocity and not time as the quantity we prefer to work with as a starting point." What is reality is that, in our theory, we are able to explain the constancy of speed of light without observers measuring length of objects differently. The reasoning about the necessary implications of speed=distance/time is thus shown to be wrong.

While the foundations of time was one place where we greatly differ from special relativity, Smolin and Rovelli – and all other rebels who would modify special relativity – are aligned with relativity's philosophy that time itself dilates, which foundation of special relativity carries over to become a foundation of general relativity. Both Smolin and Rovelli, being very interested in the philosophy of time, have written multiple books on the nature of time and what physics tells us about time. In these books they steer clear of addressing or even acknowledging the developing recent experimental reality from celestial bodies that time does not itself dilate; again, these experimental observations from cosmic cocks imply that time itself does not dilate because if time itself dilated then cosmic clocks in frames moving relative to us would show the time dilation that atomic clocks moving relative to us do. We have a full chapter on the nature of time, where we discuss varied philosophies of time and see what is consistent with reality, taking into account emerging recent experimental results.

As Smolin points out, American universities do not like to employ those who would even slightly modify special relativity. Of course, suggesting that special relativity was wrong in a foundational way — such as time itself not dilating — would shut doors of physics departments not just in America but across Europe, China, India and indeed the whole world. Such is the pervasive devout worship of special relativity.

Smolin and Rovelli, while proposing discrete space, are particularly great admirers of the spacetime equations of general relativity and have based their life work on it being true; therefore in their attempt to make modifications they strive to maintain general relativity almost exactly as it is.

Most of these self-declared independent thinkers who are looking to find some wrong assumption in accepted physics have limitations in that they are not able to overcome the shared blind faith in the foundations of relativity and its philosophy of time; thus they evade rather than confront recent looming theoretical and experimental problems with special relativity

In founding special relativity, Einstein continued thinking along the 'linear' foundations of Newtonian physics and made further unstated assumptions about velocity. Einstein's velocity *addition* is also 'linear' just as a Newton's was. Einstein failed to abandon this 'linear' thinking in Newton's laws and thus failed to get the right equations. Newton did not have any information that would suggest that light is not obeying classical velocity addition, so there was no reason for him to think beyond simple linear classical velocity addition and look for a new theory of velocity. Einstein had the facts about the behavior of light but was unable to abandon the 'linear' velocity addition of classical physics, and built relativity on this continued 'linear' thinking.

You can skip the below technical paragraph if you wish, since following it is not necessary for continued reading.

Einstein did not have a theory of velocity different from Newtonian. There is a ($u_x \pm v$) term denoting simple 'linear' velocity addition that appears in both Newtonian physics and relativity. Let us look at typical setup which considers two observers, You and Other, who are looking at a moving object. Other is moving at velocity v is the positive x-direction relative to You. If You see an object moving at velocity u how does Other see that moving? In chapter 1 we looked at motion in a single line for simplicity but, of course, objects move in three dimensions. Velocity is a vector with a magnitude (value) and a direction, and a vector can be broken into components along x, y and z directions. u_x represents x-component of the velocity u. Vector components are numbers with signs, and the sign given to individual components comes from the vector's direction. Breaking vectors into components is a way to add or subtract vectors. It is the x-component, u_x, which is added or subtracted from v because v was assumed to also be in the x direction. Given that we took v to be in the positive x-direction, according to Newtonian physics (ignoring relativity) Other will see the x-component of velocity of the object to be $u'_x = (u_x - v)$. In relativity this ($u_x - v$) term also appears in its formula for u'_x. In relativity ($u_x - v$) itself is not the x-component of velocity as seen by Other but is still a linear velocity addition. In our theory velocity addition is not linear because from u_x and v we get jumps per unit time N and those are what we add, as explained in the previous chapter. Thus we have a theory of velocity that abandons the 'linear' velocity addition of Newtonian and relativistic physics.

Einstein further founded relativity on the standard interpretation of absolute time in Newtonian physics. We do not agree with this interpretation of time and, in fact, this interpretation is linked to the question of whether speed or time is the primary physical quantity.

Physics books widely state that in classical physics time is "absolute" by which they mean that is an independent quantity that "flows" at a constant pace. What all these books have been repeating for centuries has become the standard and established interpretation. We do not agree with this interpretation of time in Newtonian physics. *In fact, no equation of classical physics implies that time is an independent quantity that "flows" at a constant pace*. This statement would be surprising to many readers, and would contradict what they have read in many text books and popular science books that detail the path from Newtonian physics to special relativity. It would also be surprising to Einstein, as we discuss below! If physics is equations then these writers failed to understand Newton's laws and equations, and what these equations imply about time. They went for Newton quotations from *Principia*; but these quotes about time are just secondary opinion with no physics equations to back it up. You can either go after the superfluous or you can try to understand physics through what the equations imply; physics authors have unanimously chosen the former when it comes to classical physics and time.

In our analysis we are ignoring superfluous statements, such as Newton's statement about time from *Principia*, and looking at the equations of Newtonian physics and what they imply about time. Physicists and philosophers have written much about a clash between Newtonian physics and philosopher Gottfried Wilhelm

Leibniz regarding the philosophy of time. Leibniz stated that time is not an independent entity that "flows", but comes into existence because there is change. (Note that motion of an object, of course, is a change). According to Leibniz's philosophy, if nothing changed there would be no time. However, the *equations* of Newtonian physics actually do not contradict the philosophy that if nothing changed there would be no time. We will come back to Leibniz and Newton in a later chapter, and there we will also look at the superfluous *Principia* quotes.

Einstein, throughout his life, held the standard view that in "*classical physics*" "*time is something 'absolute' which flows in the same way for all observers*" (quote from the book *The Evolution of Physics* by Albert Einstein and Leopold Infeld) [ ]. We further quote from the book *Relativity: The Special and General Theory* by Albert Einstein which states: "*As a matter of fact, according to classical mechanics, time is absolute ... We see this expressed in the last equation of the Galilean transformation (t' = t)*" [ ]. Here t and t' represent time as measured by the two observers. We do not take t' = t in classical physics to have meant that time itself was "absolute" and "flows" as an independent physical quantity – it only meant that the *physics equations* worked in such a way that all observers measured the same time for the same event. Einstein could argue that he is entitled to his interpretation of what t' = t of classical physics means, and this interpretation is also consistent with what Newton stated in the *Principia*. However, we consider those statements in the *Principia* to be superfluous and, looking at the equations of classical physics, see no reason to take t' = t to imply that "*time is something 'absolute' which flows in the same way for all observers.*" Again, t' = t simply follows from the other equations of classical physics and there is no need to make it an independent statement about time "flow" and observers.

We, of course, agree that the t' = t of Newtonian physics is now known to not always hold true, and this is an extraordinary and revolutionary implication of the constancy of the speed of light. Thus Newtonian physics is history because its equations do not hold true and need replacement! What we are addressing here are the interpretations regarding the nature of time in the equations of Newtonian physics versus those of special relativity.

As we did for time in Newtonian physics, we look at the *equations* of special relativity and what they say about time. In special relativity the t' = t of Newtonian physics changes to t' = gamma-factor • t where gamma-factor is the time dilation ratio that is calculated by a formula using the relative velocity v between the inertial frames of the observers. In the Lorentz transformations time actually is an independent physical quantity *because* these equations represent actual time dilation. This claim about time we consider to be highly questionable philosophically, and this was a major motivation in our finding alternative equations that are consistent with relativity's two postulates. In both our theory and Newtonian physics there are established equations for velocity addition, and *from these* and other equations comes the relationship between t' and t, depending on the event being measured. The equations of Newtonian physics are such that we get t' = t for all events. In special relativity t' = gamma-factor • t is a time dilation formula that applies between the inertial frames of the two observers and, using this formula, the ratio of time rates between clocks in the two inertial frames is computed from the relative velocity v between the frames. In special relativity t' = gamma-factor • t was

"derived" by Einstein and from this formula equations for velocity addition were then found. We do not agree with this philosophy of first getting an independent time equation and then from that getting equations for velocity addition. It all goes back to the issue we discuss above and in chapter 1 regarding velocity and time, and which of these should be taken to be the primary quantity, from whose equations we then get the equations for the other quantity.

In Newtonian physics different observers will measure the same time for an object travelling a certain number of distance units from one point to another. In our theory different observers will measure the same time if we talk of number of jumps an object makes (and do not go into length of these jumps). However, in our theory when two observers are measuring an object travelling a certain number of distance units from one point to another they will measure different times. This difference in measured time arises because of differences in jump lengths that the object is observed to make, and in fact the observed times have the same ratio as the observed jump lengths. (From chapter 1 we have v = NLd where jump length is Ld, with d causing "shrinkage" of the jump length. If there was no "shrinkage" then we would have t' = t for all events). But, in our theory, observers measuring different times does not mean that time itself has "dilated" causing different relative time "flow" between the frames. In our theory we cannot talk of time other than with respect to a specific event being measured; all we can say is that for a specific observed event we have measured different times. This different time measurement results from the mechanics of the equations associated with the specific physical event being measured. Again, this is unlike the Lorentz transformations where time *itself* dilates. In our theory, the ratio between the time measured by the two observers depends on the event being measured (and in certain cases observers in different frames could measure the same time); however, this could never happen with the Lorentz transformations because there the time ratio comes from the gamma-factor of the time dilation formula between the observers' inertial frames of reference and does not depend on the specific event being observed. Comparing the mathematics of our theory with the Lorentz transformations, we note that in our equations the ratio between the times measured by the two observers depends on both v and u_x whereas the gamma-factor of the Lorentz transformations depends only on v [technical additional detail in foot-note]. We have explained v and u_x previously, and u_x comes from the specific event being measured.

To illustrate special relativity's time dilation many textbooks and popular books give the example of the "light clock," and some of these use it to show the calculation of how the gamma-factor emerges as the time ratio. The light clock consists of a single photon of light bouncing back and forth between two parallel mirrors. Another light clock moves relative to it. In this case our velocity formulas give the same results as the velocity formulas of relativity; in both theories the key velocity ratio for the observers comes out to be 1/gamma-factor. Then, since the distance between mirrors is held constant, this velocity ratio leads to time ratio simply from time=distance/velocity, and gives the time ratio to equal the gamma-factor. Nothing in light cock example shows that time *itself* dilated, though physics writers argue it does. There is no logic to such arguments, though they have historically been very successful with gullible or uncritical readers. In the physics classrooms professors write out Einstein's derivation, which is based on flawed logic, to show that it necessarily follows from the postulates that time itself dilates; our counterexample to this taught derivation is definitive proof of its flawed logic! And the quasars time dilation failure of special relativity is never mentioned

in any textbooks, popular books, or in physics classrooms in discussions of time dilation.

In relativity time measured by different observers changes in such a way so as to have velocity of light remain the same for all observers. In our theory the formulas of velocity and velocity addition are such that if follows from them that 1) velocity of light remains the same for all observers and 2) in certain cases different observers will measure different times for the same event.

Of course, clocks are not devices that have a methodology to "pick out" the time part from any supposed space-time out there; they have mechanisms and the motion involved in these mechanisms determines the times that clocks show. In our theory different clock mechanisms observed by the same two observers could give different time ratios. This is a key experimentally testable way to decide between our theory and special relativity. Note that if different clock mechanisms observed by the same two observers give different time ratios then it would show that time *itself* does *not* dilate, because if it was time itself that was dilating then *all* clocks in an observer's frame would necessarily record the same dilation.

In particular the equations of our theory state that there will no time dilation whatsoever when one looks at an event which involves emission of light from a source *and* in which the source is moving along the same line of motion as the emitted light. For observers on Earth, celestial clocks such as quasars match both criterion; these objects are being observed to show no time dilation in a clear violation of special relativity's time dilation. Technically, taking the relative motion between source and observer to be in the x-direction, this corresponds to observed light having $u_x = c$ and our theory correctly predicts that such a case we will have will have $t' = t$. Note that this is different from the light clock where a photon of light is bouncing back and forth between two mirrors, which means a direction that is perpendicular to the x-direction of motion of the source relative to the observer, so for the light clock we have $u_x = 0$ and $u_y = c$. In the case of the light clock both theories correctly give t' = gamma-factor • t, but special relativity incorrectly says that this time relation should hold irrespective of clock mechanism.

Special relativity's Lorentz transformations were later expressed as a four-dimensional model called Minkowski spacetime, after the mathematician-physicist who did this reformulation.

We do not have a four-dimensional spacetime, and nor can that type of spacetime be built using our equations. We can all observe our physical three-dimensional world, so why should we look for complicated theories with more dimensions? However, many of today's leading physics theories have gone beyond even the four-dimensional spacetime of relativity by adding more space dimensions. String theory – the leading quantum gravity theory in terms of count of physicists working on it (with loop quantum gravity playing catch-up) – includes numerous strange space dimensions. Our equations show that is was wrong to conclude that just because all observers see light at the same speed one must give up our familiar three-dimensional space of Newtonian physics, with time being separate, and develop a strange new four-dimensional spacetime. Of course, as noted above, we do not agree with how physicists – including Einstein – interpreted time in Newtonian physics; we have stated our interpretation. And we absolutely do not agree with the

philosophy adopted by Einstein, Minkowski and then others, and which is built into their equations, that time *itself* dilates. And as time dilation experiments show, neither does nature!

We do not need to go into mathematical details of special relativity's spacetime, particularly since we do not want to discuss again what we noted above about time in special relativity versus classical physics. We rest our discussion on the Lorentz transformations. We need not go further because there is no spacetime if the Lorentz transformations are wrong.

Different philosophical thinking can actually lead to different physics equations, as we have shown. However, the importance accorded to the role of philosophy in physics by Einstein and many of his predecessors is not shared by most physicists today. Einstein's quotes below from 1936 [ ] and 1949 [ ] respectively give a glimpse of his views:

> The physicist cannot simply surrender to the philosopher the critical contemplation of the theoretical foundations; for, he himself knows best, and feels more surely where the shoe pinches. In *looking for a new foundation*, he must try to make clear in his own mind just how far the concepts which he uses are justified, and *are necessities* [italics mine].
>
> A knowledge of the historic and philosophical background gives that kind of independence from prejudices of his generation from which most scientists are suffering. This *independence created by philosophical insight* is – in my opinion – the mark of distinction between a mere artisan or specialist and a *real seeker after truth* [italics mine].

The value given to philosophical thinking in the physics of space, motion and time has dramatically declined in the decades after Einstein's death. In fact, even the possibility of different philosophical thinking from that of relativity that could lead to new foundations is mocked and dismissed. The authorities of today's relativity worshipping church of physics do not tolerate "independence created by philosophical insight" that could lead its devout believers to become "real seekers after truth" who start "looking for a new foundation" that contradicts special relativity! With physics theories becoming increasingly mathematically complicated, no can join physics today without having excellent mathematical skills. However, from this group, the priests of the church of physics choose those who will devotedly join church authorities in their blind worship by accepting special relativity as true and building on its implications; there are no openings for skeptical scientists. Skepticism regarding the foundations can arise from philosophical questioning; such philosophical contemplation, which poses the greatest danger to scientific dogma, has been entirely banished from physics.

Einstein biographer Abraham Pais talks of the "admiration of his peers" and the "general public" [ ]:

> He is a new Moses come down from the mountain to bring the law... Behold, a new man appears. His mathematical language is sacred yet amenable to transcription in the profane: the fourth dimension ... He fulfills two profound needs in man, the need to know and the need not

to know but to believe.

To devout relativity worshipping physicists, considering replacing Einstein's holy law of nature with an alternative would be sacrilege. To this end they ignore or suppress theoretical and experimental problems with special relativity. There is no faster way to make today's physics authorities turn away in disgust, anger or mockery than to suggest reasons that special relativity may be wrong. (We are, of course, referring here to proper and rigorous reasons and not to frivolous questions or lack of basic understanding). The reason for such behavior is that these physics authorities have embraced a strict religious doctrine where there can be no true faith but relativity, and to them it is unthinkable that any facts and reason against their faith can ever be valid. The hype and suppression methodologies of the relativity worshipping church have caused physicists to become so totally convinced that relativity is the unquestionable truth, and have so subjugated their faculties of intelligence and independent thinking, that they simply cannot consider facts and reason against relativity. What separates today's physics authorities from Einstein is that Einstein intellectually addressed any genuine matters that arose – even after relativity had become dominant – rather than suppress and ignore such matters. That scientific methodology of open intellectual discourse has been replaced not just by anti-intellectual conservatism but, in the case of most leading relativity worshipping physicists, by a fanaticism that contrasts surprisingly with the comparatively intellectually honest way authorities of other churches can today acknowledge and address arguments against their texts. The relativity worshipping fanatics not only do not acknowledge any truth or logic that would challenge their faith but, fighting for the continued dominance of their faith, have evolved into being the world's most skilled public and media relations experts who work fiercely to prevent dissemination of any scientific facts that challenge relativity. What causes relativity worshippers to be far more militant in their pursuit of suppression and evasion than worshippers of other faiths? Part of the reason is that other churches can often defend what is factually wrong by reinterpreting the scripture or declaring certain text to have been metaphorical and not meant to have been taken literally, whereas physics deals with equations that often leave no wiggle room, and thus acknowledgment and dissemination of problems with these can be fatal. Another reason is that worshippers and preachers of traditional religions, who operate with similar lifetime devotion to the written text, do not see their life's work become invalid if a passage or two from the text is shown to be wrong; however, physics is specialized with the equations of relativity being one of the two major foundations, and replacing these equations by new equations which do not limit down to them would mean the invalidation of the life work of a long line of powerful relativity worshipping physicists.

Comparing the workings of relativity worship within the church of physics to the worship methodologies of traditional religious groups, a major differentiation that can be seen between the two groups is that physicists worship relativity theory first and above all else, and Einstein second as the revered founder and proponent of the theory. Thus when church of physics authorities take various media podiums and give worshipful sermons on Einstein and relativity, they are expressing their faith in relativity as being the one and only possible path, and are not open to the founder's suggestions regarding other possible paths or beliefs. This is unlike traditional churches where everything the founder stated regarding the shared belief is revered. A prefect example of this divergence between the ways of this modern church and traditional churches is that Einstein's

own below comments that would go against the relativity are shunned by relativity worshipping physicists. Einstein, being a thoughtful scientist who pondered rather than religiously memorized foundations, was not a relativity worshipper. He actually seemed to be becoming, in his old age, open to the possibility that relativity could need replacement. Einstein expressed an intuitive feeling that physics may need to abandon "continuous structures" (though not in the way presented in our theory) and this would cause serious problems for relativity. Einstein never doubted that the postulates of special relativity were true, but he seems to have realized that removing the foundation of continuity could have consequences. In chapter 1 we showed how we get a different set of equations by assuming space to be discrete for motion of mass but continuous for motion of light. Einstein's 1905 special relativity paper, though having no citations to previous works, acknowledges "the loyal assistance of my friend and colleague M. Besso, and that I am indebted to him for several valuable suggestions" [ ]. Besso, though an engineer and not a physicist, was credited by Einstein as being "the best sounding board in Europe" for his physics ideas [ ]. Einstein wrote to Besso in a 1954 letter: "I consider it quite possible that physics cannot be based on the field concept, i.e. on continuous structures. In that case, nothing remains of my entire castle in the air, gravitation theory included" [ ]. Anyone expressing agreement with these comments of Einstein is denounced as a "crackpot" by the church of physics. In fact notorious relativity worshipping professor John Baez who, as mentioned in chapter 1, is an expert in spreading misinformation about the experimental status of relativity, has a "crackpot index" out which mocks any suggestion that "Einstein, in his later years, was groping his way" away from relativity. That "index" has been publicly supported by relativity worshipping authorities and this 1954 Einstein quote is taboo in the church. Reason would have created an occasional spark of worry among some bold physicists regarding blindly clinging to relativity as the one and only possible path, but the church has taught its members set aside any doubt and to faithfully devote their lives to building on relativity. Many relativity worshipping physicists import the full orthodox religious experience of traditional churches into the church of physics. These orthodox worshippers, many of whom spend their entire lives expanding on relativity, seem able to completely expunge from their minds the reality that messiah Einstein himself expressed doubt; then, for them, their blind faith in relativity becomes the same as faith in the messenger, matching traditional religions.

Special relativity is the greatest scripture of the church of physics, followed by general relativity. The church, with its money and power, is determined to preserve relativity and has been doing so by using any means necessary. Its greatest weapons are devout and seasoned relativity worshippers who are experts at suppression of theoretical and experimental facts that could lead one to doubt special relativity. These religious zealots determinedly prevent any public dissemination anywhere of facts that go against special relativity, as we have experienced, while simultaneously propagating false or exaggerated claims about its experimental successes. Whatever criticism is due to these priests for their pretense of being objective scientists, one must acknowledge that their skill at hyping their beliefs and suppressing facts against these is way superior to that of their counterparts at other churches. Such outstanding expertise in public relations has been instrumental in helping the authorities of the church of physics achieve absolute reverence among their physicist members, and indeed the world, for the special relativity scriptures.

Reason and fact pose little challenge to the faith of relativity worshipping physicists, because they ignore or

suppress these. With the entire church of physics community entranced with blind faith in special relativity, no one wants a discussion about whether Einstein's derivation or reasoning that the two postulates *necessarily* lead to the Lorentz transformations is scientifically and mathematically valid. Suppression of our counterexample to Einstein's derivation is part of the church methodology practiced by seasoned relativity worshippers; we document our interaction with church authorities in a later chapter. The facts regarding time dilation experimental failures are similarly suppressed and ignored by relativity worshippers.

Relativity worshippers spend day and night thinking about, discussing, preaching and building on special relativity but, being devout worshippers, they never think of refuting relativity and do not tolerate such thinking within their church. The shared religious blind faith that pervades physics slams the door on entry of would-be skeptics and questioners who may turn into nonbelievers or, even worse, work to refute physics' most admired scripture. Perhaps the most pure and devout worshippers of any church on Earth are the high priests of the relativity worshiping church. These most faithful worshippers exhibit their holiness and blind faith by spending their entire lives building on theories founded on special relativity being true, and do so with pure faith that is unencumbered by the reality of scientific facts against it. They can worship free from worry of any scientific facts that could make them doubt the scripture because their church – unlike other churches – is able to suppress scientific facts. The other churches lack power in that they are not gatekeepers of science – at least not today – and thus cannot attempt suppression of scientific facts that go against what is in their texts. Thus these churches are forced to act scientifically and that means they even have to re-evaluate what they have worshipped as being fact for thousands of years. An example is the creation versus evolution debate. Pope Francis, accepting scientific reality, has thus stated the new position of the church: "Evolution of nature is not inconsistent with the notion of creation because evolution presupposes the creation of beings which evolve" [ ].

In discussions about the relationship between science and religion, often the claim is made that churches are, or previously have been, in conflict with science. But we must note that neither the traditional churches, nor indeed the church of physics, are against the pursuit of science in general. Even historically, churches have generally made no attempt to suppress scientific facts with the exception of those few facts that were in direct contradiction to what is stated in their worshipped scripture. In fact, churches have often been enthusiastic supporters of independence in scientific investigations, with only this one narrow restriction. Similarly the church of physics is open to facts and reason that contradict previously held beliefs, with the exception of that which would go against their worshipped relativity, with special relativity being far more sacred than general relativity.

Given the suppression-based church of physics education that all have received, almost no one in theoretical physics thinks that special relativity can be wrong and thus no one works on finding a replacement; in any case, such theoretical work would be blocked by the church censors. However, some physicists have been able to publish the belief that general relativity may be wrong and have successfully disseminated alternative theories of gravitation but, of course, even a proposed alternative to general relativity has to be consistent with special relativity. Among the two groups (those who believe general relativity to be true and those who don't) the

believers have support of the leading physicists – church of physics authorities who will absolutely not tolerate any dissemination of a potential rival theory to special relativity and only grudgingly tolerate intellectual freedom regarding alternative gravitation theories. Thus the balance of power lies overwhelmingly against those who want to show general relativity to be wrong, and they are marginalized and face a David vs. Goliath situation. Vast sums of taxpayer money are being spent on experimentally testing general relativity's spacetime – with pre-determined strategy that looks for a successful confirmation of general relativity which physics authorities can victoriously announce to the world.

The methodology at the billion dollar Nobel prize winning LIGO gravitational wave observatory is particularly disturbing. Starting 2015 highly-publicized alleged detections of gravitational waves from black hole collisions have been touted as confirmations of general relativity. LIGO has built into it a system whereby signal templates, such as a template for black hole collision, can be secretly and quietly injected. The signal injection system is designed so that an inserted signal will not be differentiable from the real thing. Everyone within LIGO's upper echelon believes in general relativity and LIGO was founded to prove general relativity to be true, not to objectively test whether it is true. This signal injection system was purportedly built for testing and training purposes. We have donned our Sherlock Holmes cap – and we hope it is not an Inspector Jacques Clouseau cap – and, in that role, studied the methodology of the signal injection system and other related information. Prior to the detections LIGO had internally discussed, and seemingly not found a solution to, the real danger of an unauthorized injection. What is interesting are the early post-detection reactions of those at the highest level of LIGO to the question of whether a fake signal insertion could have caused the successful black hole collision detection, and how these compare with their later revised public answers regarding such a possibility. It would seem that the fake signal injection control system was and is like a door to an experiment lab that has been left improperly secured making it possible for a group of two, or perhaps even an individual, to inject the favorable outcome. Not very impressive going for a billion dollar budget – if they were trying to turn lead into gold (only a simple analogy and no implication that the LIGO experiment is as foolish as alchemy) all that was needed was for someone who knows the way around to quietly walk through the door and put in a speck a gold at the right place! We believe such fake injection is the likely cause of the black hole collision detections, and because such collisions do not produce any other independent observables there was no way to verify if they were real or fake. The first signal almost perfectly matched the expectations template that LIGO had made from general relativity calculations. An independent science group – and let us celebrate that we still have scientists on our relativity worshipping planet who can openly challenge experimental claims that have won the endorsement of powerful church of physics authorities – has courageously raised possible questions about the "integrity of the claim" [ ] of LIGO's black hole collisions. These questions arise from their unearthing peculiar properties of the LIGO black hole collision signal, which seem consistent with it being an injected signal. The local background noise in the claimed signals captured at the two LIGO observatories had a correlation; such noise correlation seemingly should not be there if the signal actually originated from outer space and travelled to these detectors separately.

This noise correlation controversy arose in June 2017 and was not resolved. LIGO was looking for the upcoming 2017 Nobel prize for physics, which was to be announced at the beginning of October 2017. This LIGO general

relativity confirmation had the all the powers-that-be of the church of physics behind it. However, the news of alleged problems with the "integrity of the claim" cast a pall on the validity that could affect the Nobel prize chances, despite the widespread support of the physics establishment. Much to the chagrin of LIGO officials and supporting physics authorities, the controversy was picked up by some popular science sources, though not by the big name science publications. Being experts at public relations, physics authorities realized that answering the critics would create more press coverage. LIGO had a strategy in the works to overcome and neutralize any doubts that may have arisen in the public mind; this strategy came in the form of the Virgo gravitational wave observatory which could confirm black hole collision readings to be real. Virgo was being upgraded, and came online in the second half of 2017, after LIGO had already made multiple gravitational wave detections of black hole collisions. On September 27, 2017, LIGO and Virgo jointly announced that on August 14, 2017 they had independently detected the same gravitational wave caused by a black hole collision. This independent confirmation by Virgo of validity of LIGO detections was the decisive victory needed. To this had been added an intentionally leaked upcoming announcement of observation of gravitational waves from colliding neutron stars, which caused a great flurry of excitement about the future of LIGO. On Oct 3, 2017 LIGO got the Nobel prize for the detection of gravitational waves from colliding black holes. But the Virgo detection may not have really been independent! Virgo could confirm the LIGO detection because their system is not independent in that fake signals injected at LIGO also go into the Virgo system. A September 16, 2010 gravitational wave event dubbed "Big Dog," which was an officially approved secret injection for training purposes, was "seen strongly in the two LIGO detectors, less strongly in the Virgo detector" [ ]. Replication of this same variation between the LIGO and Virgo detectors in the August 14, 2017 detection, beautifully illustrated pictorially for all the public to see, gave Virgo's reading a further look of independence. That September 16, 2010 fake signal matches very closely what is claimed to be the first 2015 actual signal. Quite possibly, a similar LIGO injection did the trick on August 14, 2017 and secured the "independent" validation from Virgo and the Nobel. Even today, if Virgo were to rid itself of LIGO's signal injections then it may no longer be able to provide any matching confirmations of LIGO detections of black hole collisions; we feel that this objective test of physical reality should be immediately implemented. However, the relativity worshippers who control physics today will likely not allow such objective testing of general relativity; with a Nobel prize as their backing that confirms that black holes were observed to have actually collided and merged, precisely as predicted by general relativity, they do not have to pay heed to such criticisms.

LIGO has, as mentioned above, also detected gravitational waves from a pair of colliding neutron stars, and announced this in a highly anticipated press conference on October 16, 2017. This celestial event, which occurred on August 17, 2017, was hailed as launching a new era of multi-messenger astronomy based on the role of gravitational waves, with all of physics applauding. Stars certainly do exist and they could collide but this does not make general relativity's equations reality; LIGO here did not have the freedom to create an experimental reading that perfectly matches templates made from general relativity's predictions because readings also come from light emitted which can be observed and cross-checked by independent telescopes. Further, just because LIGO is called a gravitational wave detector does not mean it actually detected gravitational waves; the ultra-sensitive LIGO detectors give readings on all sorts of disturbances, whether Earth-based or cosmic. Two neutron stars colliding is as a massive disturbance and an incredibly powerful

event that occurred within distance range and was picked up by this ultra-sensitive machine. How can we be sure that stretching and squeezing of space or spacetime, the feature of general relativity's gravitational wave that LIGO reading is supposed to measure, was actually the cause of the LIGO neutron star collision reading? Physics authorities, of course, have been concluded that such a spacetime ripple was the cause and their media partners have so convinced the general public.

Space is awash with electromagnetic waves which include visible light as well as the invisible spectrum: radio waves, microwaves, infrared and ultraviolet radiation, x rays, and gamma rays. Today we have various telescopes that specialize in studying individual types of radiation, and from these we learn that events such as neutron star collisions produce diverse types of electromagnetic radiation. How can we confidently conclude that the LIGO detection here did not result from electromagnetic radiation produced by the neutron star collision? LIGO effectively functions as an antenna or telescope that is highly sensitive to disturbances of all sorts and would be affected by wavelengths which are beyond what conventional telescopes pick up. One must note and appreciate that LIGO has, over the years, gone to great extent to identify and rule out many well-known electromagnetic sources that create readings, but we have not found how they rigorously ruled out measuring the effects of the various types of high intensity electromagnetic waves produced by the neutron star collision. In our opinion, it is an open question whether these LIGO readings interpreted to be gravitational waves could have come from structured electromagnetic waveforms produced by causes (such as neutron star collisions) that have not yet been so well studied. It might be wise for LIGO to visit their neutron star event data assuming (even if just for curiosity and argument's sake) that all readings came from electromagnetic waveforms and then see what learnings about the properties of these impacting electromagnetic waves then arise. LIGO should release, without suppression, detailed information regarding any continued unexplained triggers or readings observed past the initial 100 seconds of the main neutron star event; such readings could contradict predictions of general relativity.

The celebrated LIGO results are something physics authorities do not want people to question. We shall look at above questions and detail our analysis of LIGO-Virgo detections in a later chapter, as well as make predictions on what will be the future observations of gravitational wave detectors, and what results the continuing drama, conflicts and questions could all lead to in the long-term; physics authorities would, of course, say there are no conflicts or questions to be resolved, let alone a drama. LIGO has perhaps been the greatest public relations victory in the 100-year history of general relativity, and physics has slammed the door on those who would raise questions.

Physics today is a high stakes public relations game which relativity worshipping authorities are experts at playing. Books such as *Black Holes and Time Warps – Einstein's Outrageous Legacy* and *The Science of Interstellar* (featuring general relativity's wormholes) by one of the LIGO Nobel Prize winners [ ] – who is, of course, a believer in relativity – shows that general relativity is so much more "fun" than the kind of simple and reasonable gravitation theory that Isaac Newton proposed. There is no doubt that Newton's gravitational theory needs replacement; but Einstein's "outrageous legacy" keeps getting more outrageous. Within the church of physics theorists build on general relativity and then, having little in the way of experiment going for

the theories, vie for support of physics authorities. Objectivity and reasonableness are given little value by today's physics authorities, who support theorists based on subjective interests. Inflation theory, founded on the spacetime of general relativity, is one of the craziest physics theories that mainstream science has accepted in that it has a multiverse comprised of an infinite number of other universes popping into existence when our universe forms, which gives the theory the feature that "anything that can happen will happen" [ ]. However, what the theory has going for it is support of physics authorities and that has been enough to win the public relations battle and become the dominant theory of the early universe. In a rare event a major popular science publication – *Scientific American* – allowed an article, in its February 2017 issue, that candidly pointed out that inflation, *as it stands today*, had little going for it beyond support of physics authorities, and raised the question of whether inflation can even be considered science [ ]. The article also pointed out that data that actually disfavored the theory was being presented as confirming its predictions. Use of a popular media forum to inform the public in plain language of such details regarding the dominant paradigm in cosmology became a public relations disaster for physics. Alan Guth – who is a bigger name than the three challengers who wrote against inflation – and three other proponents of inflation ran to other physics authorities for support. Alan Guth seems to have had such confidence in his powerful supporters, and the continued victory of their shared subjective methodology over traditional objective science, that in 2014 he displayed a case he would keep the upcoming Nobel prize in [ ], having already won many of the lesser accolades. Guth and the other three proponents of inflation got twenty nine physics authorities – some of the best known names in theoretical physics – to sign in support of their the reply to *Scientific American* [ ]. Their reply was evasive and it seemed Guth et. al. realized that they could not defeat the arguments they faced; they felt the need to bolster their response by showcasing the names of authorities who were on their side, which included four Nobel prize winners – and with the gravitational waves Nobel prize that count increased to five. In physics authority-centered methodology has been replacing reason-based and fact-based discourse. This incident also shows how today's physics authorities herd together to hold up their accepted theories, and one can imagine how they would react if it came to public exposure of theoretical and experimental problems with special relativity! The effort to openly discuss physics in this public manner seems to have been led by the one author – Anna Ijjas – who among the three challengers was relatively a newcomer to physics and may not have yet have become resigned to the subjective methodologies of today's physics and physics authorities. Of course, powers-that-be are undoubtedly working to ensure that such dirty laundry is not washed in public, as happened with with inflation article, because today's physics authorities have a lot to hide from the public regarding their methodologies and suppressions. Such open clashes with authority are rare because professional physicists quickly succumb to the reality that today physics is largely a public relations game run by authorities, and that the path to career and financial success lies not in searching for truth or in thinking independently but in playing along by unquestioningly working on the theories that authorities are favoring.

In a later chapter we will discuss the role of authorities and what some others within physics have written about how pressure from authorities shapes the direction of physics research today and veers it away from questioning certain foundations. Why would physics authorities want to bestow the highest accolades on a theory such as inflation, with all the multiverse baggage? Why should standard and accepted physics be expanded to include what seems fantastical and involves the supernatural (we define this term to mean that

which is beyond our universe and unobservable)? One motivation is that the authorities of the atheist church of physics want to compete with the God-centered churches for the hearts and minds of the public, and physics authorities realize that multiverse can help explain why the universe seems very fine-tuned for life. While objectivity and testability might previously have been the foundations of a good theory, a successful theory in today's physics will likely be one that is line with subjective desires and agendas of those in authority. We shall further discuss fine-tuning, multiverse, and religious designs of the church of physics in another chapter. We believe that crazy theories, such as inflation, are being caused by the spacetime of general relativity, which spacetime was forced upon general relativity by its being built on Lorentz transformations of special relativity. But church of physics authorities have declared that the Lorentz transformations are not to be questioned and facts against these have to be ignored – in the church of physics such dogma and suppression is winning over reason and truth. Nobel prize winner Steven Weinberg, "considered by many to be the preeminent theoretical physicist alive in the world today," [ ] is one the signers of the inflation reply; he is both outspoken and a prolific writer and has a lot to preach about the roles and nature of religion, culture, philosophy and science. Being particularly against God-believing churches he needs and supports the multiverse concept, and his support brings many followers. In the so-called "Science Wars" Weinberg showed his leadership by battling sociologists of science who would question the claim that science and scientists act in a purely objective manner. We believe that how science and scientists act is determined by the individuals in power and there is no guarantee that only objective scientists will come into power. In particular, relativity worshippers who today hold the reins of physics cannot be considered to be objective scientists.

We note again that our own theory does not deal with gravity but only with special relativity. The mechanics of black holes, gravitational waves, and early universe come from general relativity, and these are no more directly related to our theory than they are to special relativity.

Before Galilean-Newtonian physics there was Aristotelian "natural philosophy," with its physics part centered around four texts. Aristotelian physics, though full of incorrect scientific statements that could have been challenged, served effectively as a religious scripture which scientific scholars of the time could not even imagine questioning, just as physics scholars today cannot imagine questioning special relativity. Scholars who excelled at Aristotelian physics and science enjoyed great respect and controlled scientific thinking in Western universities for centuries, imparting to their students their blind faith in this science. However, nothing of the work of such scholars – which was based on blindly accepting authority – survives as a worthy work of science. Similarly the works built on blind faith in the equations of relativity, whose foundations can be seen to be based on faulty reasoning, will, we believe, eventually have no value to future physics; the value of the works of these physicists will mainly be to historians and sociologists of science in comparing these dogmatic attitudes of relativity worshippers to the similar blind faith of those who followed the wrong physics of Aristotle. We will examine how physicists developed such faith in the Lorentz transformations based on Einstein's 1905 paper and some experimental observations – in the short span of just a hundred years – and compare it to the scripture-based and observation-supported faith that Vatican priests had in the Earth-centered universe. We shall also discuss abuse of power and attempted suppression by church authorities when their blind faith is challenged by scientific facts they cannot counter, and compare the very similar

reactions of church of physics priests such as Steven Weinberg and the past priests of the Vatican, with both adopting the tactic of officially "banning" such scientific facts from being published.

Newtonian physics was an extraordinary and positive change from what was before – it was a *paradigm shift* (to use philosopher Thomas Kuhn's famous term) and a true revolution. However, we do not agree with Kuhn's philosophy of recurring "incommensurable" paradigm shifts; many have expressed dissatisfaction with this claim of Kuhn, and our equations help demonstrate that such critics are right. Newtonian physics has shown itself to be a foundation that any future equations must limit down to, and indeed both the Lorentz transformations and our equations follow this foundation. So, rather than be "incommensurable" with future physics, all future physics has to precisely link to its equations. But, moving beyond paradigms, neither Newton, nor Galileo or Einstein or anyone who comes later, can change the reality that physics is a human enterprise in which faith, power, prejudices and groupthink are often in battle against facts and reason. Whether truth and reason prevails over such factors substantially depends on the nature of authorities who have control. Once a methodology of faith gathers momentum in a field of science, it can continue defeating facts and reason for a long time, until a time is reached when the authorities leading the faithful lose power or relent by embracing objectivity.

Physicists, and people in all fields, generally line up behind authorities because, among other reasons, this is a path to job security and respect within the community. All authorities are not necessarily opponents of independent and original thought and, particularly in intellectual fields, certain authorities can be willing to follow unsettling truths no matter where they lead. Sometimes science authorities are objective and open to truths that would surprise them, and these are periods when a field such as physics progresses rapidly and solves its dilemmas. In the early 1900s, when special relativity was born, science was in such an open and objective phase.

In science, unfortunately, sometimes authorities in control are of the kind that they have unshakable faith in the foundations, and are willing – and even determined – to ignore and suppress truths that go against this faith. Physics ruled by such authorities can become stuck within a culture of blind faith and suppression, which could last for generations; these times of conservative dishonesty do not lead to substantial progress. In this battle against reason and evidence, physics authorities would adopt social methodologies such as declaring those who point out genuine shortcomings of their admired theory to be "crackpots" who are to be ignored. Mainstream physicists of such times would work under the peer pressure of proving themselves to be respectable physicists by proudly standing with the admired foundational theory, and joining the authorities in applauding the successes of the foundational theory while closing their eyes to its shortcomings. The resolute and adamant physics authorities who are in control would increasingly employ the suppression methodology to prevent dissemination of facts that are against their beloved theory and which they cannot counter. This could be a time when original theoretical research that has value largely ceases because a successful path would require overthrowing the foundational theory, which is not an available option. In such times theorists who have enough sagacity and boldness to critically examine the foundational theory and realize that it could be what needs replacement would most likely leave physics in frustration. Among those who continue

theoretical research along officially accepted lines, symptoms of building on the wrong foundations could manifest through increasingly complicated and fantastical theoretical explanations of physical phenomenon, as a result of which these physicists would have to shun simplicity and elegance as a guiding concept. Such theories would likely not be experimentally testable and would have to resort to claims of "indirect" experimental support; victory for a theory would be its (subjective) popularity among physicists. In these dark times "real seekers after truth" (see Einstein quote above) would be rare. The few pursuing truth could include the independent outsider who has fully analyzed the foundational theory and whose critical thinking has not been subject to the constant assaults of the mighty waves of faith and tribalism that have carried away the objectivity and reasoning of professional physicists; others pursuing truth could include the very rare professional physicist who, despite having poor career prospects and being mocked as a "crackpot" by those who comfortably stand with physics authorities, determinedly continues to pursue a path away from worshipped foundational theory. Breakthroughs by such rebels, however, are likely to be shut out by physics authorities who have mastered the methodology of suppression of facts and reasoning that challenge their faith. The lost mainstream physicists of such a time, while clinging blindly to their faith in the foundational theory, could find solace and success in becoming public relations experts who turn outwards to passionately spreading their dogma across the general population by religiously singing its wonders via various media. In such preaching to the public, physicists would withhold from the public the foundational theory's scientific problems because an objective evaluation of these facts, not influenced by the faith-based bias prevalent among physicists, could turn the public into doubters. The public acclaim of their foundational theory would not be because the public shares the unshakable faith of physics authorities, which transcends fact and reason, but because the public has been provided selected facts and reason. The workings of suppression would be multi-level in that physicists authorities, using various methodologies, would try to hide from the professional physicist the theoretical and experimental problems that could make one experience moments of doubt regarding the foundation that one has faithfully accepted, and perhaps spent a lifetime building on. What distinguishes this religious phase is not that authorities, blinded by their unshakable faith, cannot personally give objective consideration to facts and reason that go against their beliefs – what distinguishes this religious phase is the fanaticism by which authorities determinedly work to suppress facts against their faith from those who might be inclined to ponder the validity of these. This phase is defined by the zealots in control and their suppression-based methodology that attempts to keep both insiders and outsiders ignorant of any reality that challenges their unshakable faith. By partnering with the media these science authorities would enjoy success and victory in fooling the world, and this realm could perhaps fly its flag of faith for a long time. Science authorities may not realize or care that deceiving the public in this manner for personal and professional gains and needs of their group is fraught with dangers for all of science. Science is judged by the behavior of scientists just as politics is judged by the behavior of politicians. It could happen that many in the public who intelligently follow science matters, on independently learning facts that science authorities are suppressing because they go against their faith, begin to realize their scientists are neither intellectually honest nor objective. The consequences of this realization could be that public trust in objectivity of science, unfortunately, begins to fall across all fields. But realizing the true and larger picture provides long-term benefits such as creating a stability that comes from people accepting and understanding the reality of different and varied phases of science. Fields of human endeavor behave in the way those in authority in the

field behave, with the behavior of authorities always subject to the possibility of being swayed by causes such as dogma, attachment, egoism, groupthink and conflicting interests; as a result, there is no field that remains pristine and above this reality of the extraordinary ups and downs of human behavior.

A phase of unshakable faith in a foundational theory – namely relativity – is what physics has been going through for decades. The paragraph above sums up well the behavior of physicists during this religious phase. For over two generations progress in theoretical physics has floundered *not because of* difficulties in resolving the incompatibility between relativity and quantum mechanics – as physics authorities and their cohorts repeatedly claim in various public preachings – *but because of the* dogmatic nature of relativity worshipping authorities who are in control, and their culture of suppressing facts and reason that could have led to relativity being replaced. Blinded by their unshakable religious faith, they not only cannot consider such facts and reason, but they also cannot allow anyone else to learn of them.

With the rise of new and potentially deceptive experimental methodologies based on opaque super-machines, with results interpreted by authorities who have shown themselves to be experts at suppression of facts and thinking that go against relativity, our planet seems destined to worship relativity under the dictates of the church of physics for a long time to come. However, the future has not happened yet and a defeat of the church methodology of suppression can still happen. Open and public scientific examination of the suppressed theoretical and experimental problems facing relativity is all that is needed to bring about the fall of the relativity worshipping church. Such a decisive victory of truth over suppression, and of reason over dogma can cause a sweeping wave that results in the re-emergence of physics as an authority-challenging and objective science. Such an event will also allow us to study in detail how physics fell from its glory days of the early twentieth century when radical new theories such as relativity and quantum mechanics were openly debated and allowed to replace previous knowledge based on their objective merits. We must look for an understanding of how and why physics abandoned open and objective examination, and adopted a new prime directive of preserving and protecting relativity and never allowing it to be replaced. We feel that this transformation resulted from the rise of a new physics culture which is centered around the influence of money, social power and media. These powerful interests, which aligned to support relativity, brought about a dramatic change in physics culture that rewards blind faith and uncritical allegiance to relativity, while penalizing, ignoring, mocking or banning questioners. The result of this change was the emergence of physics as a church, run by devout relativity worshippers, which has discarded all scientific ethics in its pursuit of suppression of both objective reasoning and objective experimentation when it comes to special relativity and, to a lesser extent, general relativity.

Physics does not have to be a church but the nature of science is variable and under control of those who rule in the field. Max Planck and others of his time were authorities with scientific integrity and objectivity who, despite being surprised by the bold new theories, would neither allow nor tolerate a culture of suppression and blind worship that would work to preserve the old theories. On the other hand, today the methodology of blind worship of relativity and suppression of its theoretical and experimental problems defines the church of

physics.

The original handwritten special relativity scriptures were not preserved but the comparatively less worshipped, but still holy, scripture of general relativity in handwritten form is made available to potential relativity worshippers, as it was in this 2010 public exhibition in Jerusalem:

> "We have set it up like the Dead Sea Scrolls, to protect them but also to give the feeling of entering a kind of holy of holies, which is how we view it," said Hanoch Guttfreund, a physics professor, former president of the Hebrew University and curator of the exhibition. "And you can actually see Einstein work as you look at the pages" [ ].

Challenges to the worshipped scripture of a church are highly unlikely to come from within the church so the real threat to these religious organizations are outsiders. The ways of the relativity worshipping church of physics are similar to those of traditional churches but this modern church, with its relativity scriptures in the form of equations, has certain unique advantages over traditional churches with their plain language scriptures, and also over most non-scientific fields. One advantage this modern church has is that there is a technical background knowledge barrier which allows its practitioners to get away with suppression of scientific facts by simply refusing publication of such facts, ignoring them post-publication, or by herding together and dismissing such facts by fabricating wrong claims shrouded in technical language. There is no independent means of public exposure or dissemination available since the worshippers of relativity are also the gatekeepers. Meanwhile, factual problems with scriptures of traditional churches would be, and have been, publicly exposed by independent outsiders with no similar methodology available for worshippers to defeat the challenger and continue to prevent these factual issues from becoming known to the public. In addition the church of physics is able to cement the faith of believers by creating new relativity confirmations by hook or by crook, whereas other churches cannot create new facts to support their scriptures. Seasoned relativity worshippers of the powerful church of physics have used these two advantages to preserve both special and general relativity and to keep teaching special relativity's derivation, which church authorities know is incorrect, in the world's classrooms.

The increasingly powerful and wealthy relativity worshipping church, with its partnership with the media and direct or indirect control over dissemination of experimental and theoretical issues related to special and general relativity, is able to maintain the awe for relativity within the public mind using both creation and suppression methodologies, and to thus continually usurp funds from taxpayers to distribute among relativity worshippers. Meanwhile, physicists who are atheists or are engaged in skeptical questioning aiming to refute relativity face career and financial depression. In fact such skeptics within professional physics are openly derided by the relativity worshipping authorities of the church and their religious minions. These atheists, being effectively shut out, usually have to find other ways to make a living and continue their work – unless they are willing to convert and devotedly worship relativity with church authorities.

Perhaps, one day, worshipping relativity and its holy equations of spacetime will emerge as a formal common

religion of all humankind. We have a full chapter about fictional planet Venuts where its atheist church of physics, armed with its holy equations, actually vanquished the traditional churches and became the main religion. Though the setting is fictional the physics concepts in that chapter are not fictional but are based on the those of relativity. That chapter serves as a construct and example to illustrate that the methodology of science can vary dramatically depending on the nature of those who rule in the field, and can obliterate not only the box it has been placed in by philosophers and academics but also the boundaries traditionally believed to separate science from religion.

Our attack on the relativity worshipping church aims directly at its central and most exalted equations – the Lorentz transformations of special relativity. As quoted chapter 1, Thomas Kuhn, points to "authority" and "orthodoxy" as the common link between science and theology while Paul Feyerabend calls science the "most dogmatic religious institution." As we noted in chapter 1 we feel that while Feyerabend's statement would correctly characterize how scientists behave in the case of special relativity, it is not an accurate generalization. Kuhn agrees that science is often "ridden by dogma" [ ] and Feyerabend further notes that such dogma "shares many features" with "church dogma" [ ]. In our view the sources of authority that influence physicists are not just physics texts but also the reactions of physics authorities to facts that challenge the texts. Those in charge can be like Max Planck and others of his time who feel an ethical commitment to fact and reason; if this commitment overrides religion-like faith in the accepted texts then this would be a case of science and scientists objectively addressing issues that arise. Or those in charge can be like the high priests of today's relativity worshipping church of physics who are determined to resist abandoning their holy special relativity equations just as high priests of other churches have traditionally resisted abandoning written text that is holy to them. When confronted with looming scientific facts attacking the scriptures which they cannot counter, the traditional recourse such church high priests adopt – if their church is powerful enough – are the twin methodologies of hype and attempted suppression, aiming to ensure that the public continues to accept these old facts over the scientific facts that contradicts them. If suppression is the path adopted by high priests then ordinary priests, motivated by shared interests as well as respect for authority, line up behind the science authorities or the church authorities who are working to suppress facts. While we agree with Kuhn and Feyerabend regarding the common nature of physics and theology, we feel that in both the nature of those in charge plays a major role in whether behaviors of these two diverse groups converge or diverge when the facts written in their texts are challenged. Many physicists like to address the wider issues of science and religion, good and evil. Physicist Steven Weinberg has raised the question of what it takes "for good people to do evil" [ ]. We shall examine the example of how "good people" such as the past scientific authorities of the Vatican and those of today's church of physics can – in anger and frustration with scientific facts that refute their most cherished dogmas – "do evil" by attempting to suppress the offending scientific truth. The church of physics sits precariously balanced on the dogma of the Lorentz transformations, with the evil of suppression as its main support.

We have above given details of our counterexample to Einstein's derivation of the Lorentz transformations, which church authorities have been determinedly suppressing. Special and general relativity's spacetime does not exist if the Lorentz transformations are wrong. In 2005 when we completed our theory which predicted

that a certain set of clocks would give no time dilation, we had no idea that such natural cosmic clocks matching our specific criteria were out there. Beyond quasars, experimental failures of the time dilation equation of relativity's Lorentz transformations have now begun piling up across space in gamma-ray bursts and even supernovae explosions [ ]; supernovae were thought to obey relativity's time dilation but it is now being realized that this was possibly because of potential bias that caused a methodology whose aim seems to have been to prove relativity right [ ]. We explain quasars, gamma-ray bursts, supernovae and their time dilation experiments in the next chapter. In our long and ongoing struggle with the relativity worshipping church, which started with our 2005 paper, we now feel optimistic that light of truth shining down from these celestial bodies may soon overwhelm the dark suppression methodologies of this powerful church. In the next chapter we also give relatively inexpensive direct laboratory-based tests which can be done, using technology available today, to further show the Lorentz transformations to be wrong.

Leave Feedback